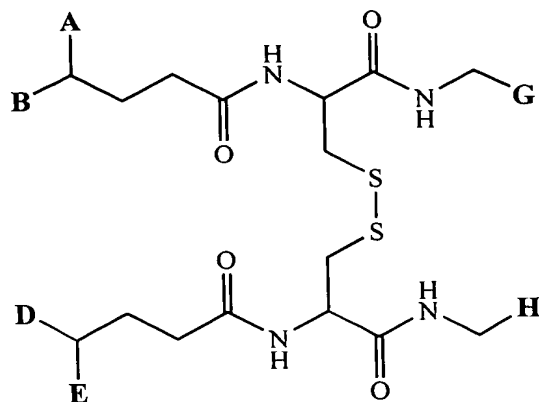


CLAIMS

1. A composite comprising an oxidized glutathione-based compound and a metal material in a molar equivalent ratio of between about 3000:1 to about 1:1, wherein the metal material comprises a metal selected from the group consisting of platinum and palladium.  
5
2. The composite of claim 1, wherein the composite comprises the oxidized glutathione-based compound and the metal material in a molar equivalent ratio of between about 1000:1 to about 1:1.  
10
3. The composite of claim 2, wherein the composite comprises the oxidized glutathione-based compound and the metal material in a molar equivalent ratio of between about 1000:1 to about 10:1.  
15
4. The composite of claim 2, wherein the composite comprises the oxidized glutathione-based compound and the metal material in a molar equivalent ratio of between about 1000:1 to about 100:1.  
20
5. The composite of claim 1, wherein the metal is platinum.
6. The composite of claim 3, wherein the platinum material is selected from the group consisting of a platinum salt, a coordination compound and an organometallic compound.  
25
7. The composite of claim 6, wherein the platinum material is a platinum coordination compound.
8. The composite of claim 7, wherein the coordination compound is cis-platin.
9. The composite of claim 1, wherein the oxidized-based glutathione compound has the formula:  
30



and salts of said formula;

wherein A, B, D, E, G and H can be the same or different and each is selected from  
 5 the group consisting of an organic unit and salts of the organic unit.

10. The composite of claim 9, wherein A, B, D, E, G and H can be the same or different and each includes a unit selected from the group consisting of amine groups, carboxyl groups and amides.

10

11. The composite of claim 10, wherein any two of A, B, D, E, G and H are linked to each other by at least one covalent bond.

12. The composite of claim 11, wherein any two of A, B, D, E, G and H are linked to  
 15 each other by an amide bond.

13. The composite of claim 10, wherein A, B, D, E, G and H can be the same or different and each includes an amino acid.

20 14. The composite of claim 10, wherein the oxidized glutathione-based compound is oxidized glutathione and both A and E are  $-\text{CO}_2\text{H}$ , both B and D are  $-\text{NH}_2$  and both G and H are  $-\text{CO}_2\text{M}$ , M being a counterion.

25 15. The composite of claim 10, wherein the oxidized glutathione-based compound is S-thioethylamine•glutathione disulfide.

16. The composite of claim 10, wherein the oxidized glutathione-based compound is *bis*-(DL-6,8-thioetic acid)•glutathione disulfide.
- 5 17. The composite of claim 10, wherein the oxidized glutathione-based compound is ( $\beta$ -alanyl-L-histidyl)•glutathione disulfide.
18. The composite of claim 10, wherein the oxidized glutathione-based compound is (9- $\beta$ -D-ribofuranosyladenyl)•glutathione disulfide.
- 10 19. The composite of claim 10, wherein the oxidized glutathione-based compound is *bis*-(L-2-amino-4-(methylthio)butanoic acid)•glutathione disulfide.
20. The composite of claim 10, wherein the oxidized glutathione-based compound is *bis*-(L-phenylalanyl)•glutathione disulfide.
- 15 21. The composite of claim 10, wherein the oxidized glutathione-based compound has an acylated primary glutamic acid amino group of oxidized glutathione.
- 20 22. The composite of claim 21, wherein the oxidized glutathione-based compound is selected from the group consisting of *bis*-(methionyl)•glutathione disulfide, *bis*-(aspartyl)•glutathione disulfide, *bis*-(histidyl)•glutathione disulfide, *bis*-(3-iodine-tyrosyl)•glutathione disulfide, ( $\gamma$ -aminobutanoyl)•glutathione disulfide, *bis*-( $\gamma$ -hydroxybutanoyl)•glutathione disulfide, *bis*-(lipoyl)•glutathione disulfide, and *bis*-(3,4-dihydroxyphenylalaninyl)•glutathione disulfide.
- 25 23. The composite of claim 8, wherein the oxidized glutathione-based compound has an amide or phosphoramidate bond to a unit selected from the group consisting of heterocyclic carbonic acids and nucleotides.
- 30 24. The composite of claim 23, wherein the oxidized glutathione-based compound is selected from the group consisting of *bis*-(pyridine-3-carbonyl)•glutathione disulfide, uridine-5'-monophosphatoyl•glutathione disulfide, inosine-5'-monophosphatoyl•glutathione

disulfide, folliculylsuccinyl•glutathione disulfide and glycerol-1,3-diphosphatyl•glutathione disulfide.

25. The composite of claim 10, wherein the oxidized glutathione-based compound is  
5 selected from the group consisting of tetra-dopamine•glutathione disulfide and  
theophylline•glutathione disulfide.

26. The composite of claim 1, wherein the oxidized glutathione-based compound is  
chemically interacted with the material comprising platinum.

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27. A method for stabilizing a disulfide bond of an oxidized glutathione-based compound,  
comprising interacting the oxidized glutathione-based compound with a material comprising  
platinum.

15 28. The method of claim 27, wherein the metal-stabilized oxidized glutathione-based  
compound is GSSG•Pt.

29. The method of claim 27, wherein the metal-stabilized oxidized glutathione-based  
compound is a salt of GSSG•Pt.

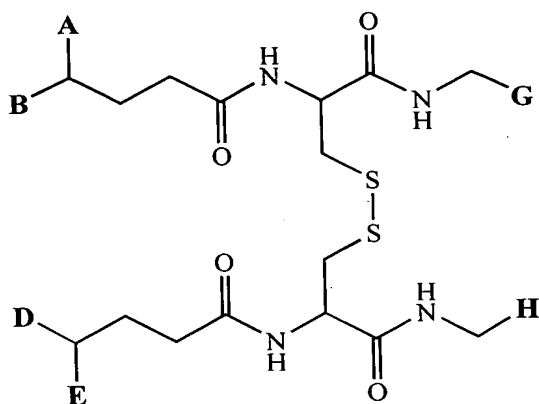
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30. The method of claim 27, wherein the platinum present in an amount of between about  
0.0003 molar equivalent to about 1 molar equivalent relative to the oxidized glutathione-  
based compound.

25 31. The method of claim 27, wherein the platinum is present in an amount of between  
about 0.001 molar equivalent to about 0.01 molar equivalent relative to the oxidized  
glutathione-based compound.

30 32. The method of claim 27, wherein the platinum is present in an amount of between  
about 0.001 molar equivalent to about 0.1 molar equivalent relative to the oxidized  
glutathione-based compound.

33. The method of claim 27, wherein the platinum is present in an amount of between about 0.001 molar equivalent to about 1 molar equivalent relative to the oxidized glutathione-based compound.
- 5 34. The method of claim 27, wherein the platinum is selected from the group consisting of platinum metal, a salt, a coordination compound and an organometallic compound.
35. The method of claim 34, wherein the material is cis-platin.
- 10 36. The method of claim 27, wherein the oxidized glutathione-based compound comprises the formula:



- and salts of said formula;
- 15 wherein A, B, D, E, G and H can be the same or different and each is selected from the group consisting of an organic unit and salts of the organic unit.
37. The method of claim 27, wherein the interacting comprises:  
providing a glutathione-based compound; and  
20 reacting the glutathione-based compound with an oxidant and a material comprising platinum to form an oxidized glutathione-based compound having a stabilized disulfide bond.
38. The method of claim 37, wherein the oxidant is selected from the group consisting of oxygen and hydrogen peroxide.

39. The method of claim 38, wherein the oxidant is hydrogen peroxide.

40. The method of claim 39, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with less than about 1 molar equivalent of the hydrogen peroxide and between about 0.0003 molar equivalent and about 1 molar equivalent of the material comprising platinum.

41. The method of claim 39, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with less than about 1 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 0.1 molar equivalent of the material comprising platinum.

42. The method of claim 39, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with less than about 1 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 0.01 molar equivalent of the material comprising platinum.

43. The method of claim 40, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with less than about 1 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 1 molar equivalent of the material comprising platinum.

44. The method of claim 40, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with about 0.9 molar equivalent of the hydrogen peroxide and between about 0.0003 molar equivalent and about 1 molar equivalent of the material comprising platinum.

45. The method of claim 40, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with about 0.9 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 0.1 molar equivalent of the material comprising platinum.

46. The method of claim 40, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with about 0.9 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 0.01 molar equivalent of the material comprising platinum.

47. The method of claim 44, wherein the reacting step comprises reacting one molar equivalent of the glutathione-based compound with about 0.9 molar equivalent of the hydrogen peroxide and between about 0.001 molar equivalent and about 1 molar equivalent of the material comprising platinum.

48. The method of claim 27, wherein the interacting comprises adding between about 0.0003 molar equivalent to about 1 molar equivalent of the material comprising platinum to 1 about molar equivalent of the oxidized glutathione-based compound.

49. The method of claim 27, wherein the oxidized glutathione-based compound is a salt selected from the group consisting of alkali metal salts, alkaline earth metal salts and transition metal salts.

50. The method of claim 49, wherein the oxidized glutathione-based compound is a salt selected from the group consisting of lithium salts, sodium salts, potassium salts, magnesium salts, calcium salts, vanadium salts, manganese salts, iron salts, molybdenum salts and zinc salts.

51. The method of claim 27, wherein the oxidized glutathione-based compound is a fluoride-containing salt.

52. A method of stimulating endogenous production of cytokines and hemopoietic factors comprising introducing to a mammalian body in need of stimulation of cytokines or hemopoietic factors or both, an effective amount of a composite comprising an oxidized glutathione-based compound and a metal material in a molar equivalent ratio of between about 3000:1 to about 1:1 wherein the metal material comprises a metal selected from the group consisting of platinum and palladium, for a period of time to stimulate said endogenous production to obtain a therapeutic effect for a disease.

53. The method of claim 52, wherein the molar equivalent ratio is between about 1000:1 to about 1:1.

5 54. The method of claim 52, wherein the molar equivalent ratio is between about 1000:1 to about 10:1.

55. The method of claim 52, wherein the molar equivalent ratio is between about 1000:1 to about 100:1.

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56. The method of claim 52, wherein the metal is platinum.

57. The method of claim 56, wherein the material is cis-platin.

15 58. The method of claim 52, wherein the composite is administered orally.

59. The method of claim 52, wherein the disease is selected from the group consisting of oncological, infectious, immunological, ischemic, neurodegenerative, metabolic, endocrinal and other diseases.

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60. The method of claim 59, wherein the oncological disease is selected from the group consisting of lung cancer, melanoma, cerebral tumors, colorectal cancer, breast cancer, prostate cancer, ovarian cancer, acute lymphoblastic leukemia and acute myeloblastic leukemia.

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61. The method of claim 59, wherein the infectious disease is selected from the group consisting of tuberculosis, viral hepatitis B, viral hepatitis C, mixed infections (HBV and HCV), herpes, meningitis (sepsis), peritonitis, acute pancreatitis and suppurative post-surgery sequelae.

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62. The method of claim 59, wherein the immunological disease is selected from the group consisting of AIDS, immunosuppressions of infectious origin, immunosuppressions of



radiation origin, immunosuppressions of toxic origin, glomerulonephritis, rheumatoid arthritis, collagenosis, systemic lupus erythematosus and atopic forms of allergic conditions.

63. The method of claim 59, wherein the ischemic disease is selected from the group  
5 consisting of ischemic cerebral conditions and ischemic heart disease.

64. The method of claim 59, wherein the neurodegenerative disease is selected from the  
group consisting of Alzheimer's disease, hereditary (Huntington's) chorea, amyotrophic  
lateral sclerosis, neuro-AIDS and demyelinating diseases.

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65. The method of claim 59, wherein the neurodegenerative disease is a neurobehavioral  
disease selected from the group consisting of narcotic abstinence, cerebral hypoxia, manic-  
depressive psychosis and schizophrenia.

15 66. The method of claim 59, wherein the metabolic disease is atherosclerosis.

67. The method of claim 59, wherein the endocrinal disease is associated with  
hypothalamic-hypophysil-ovarian function.

20 68. The method of claim 52, wherein the therapeutic effect comprises a process selected  
from the group consisting of regulating proliferation in normal cells, regulating  
differentiation in normal cells and inducing apoptosis of transformed cells.

69. The method of claim 52, wherein the composite is administered in a dosage of  
25 between about 0.1 mg/kg to about 1.0 mg/kg by body weight.

70. The method of claim 52, wherein the composite is administered in a dosage of  
between about 1 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> by body surface.

30 71. The method of claim 52, wherein the composite is administered as a solution form  
selected from the group consisting of inhalation solutions, local instillations, eye drops,  
intranasal introductions, ointment for epicutaneous applications, intravenous solutions,  
injection solutions and suppositories.

72. The method of claim 71, wherein the solution has a concentration of between about 1% to about 10% of the composite.

5 73. The method of claim 52, wherein the composite is administered as an injectable form.

74. The method of claim 73, wherein the injectable form comprises the composite in a solution in a concentration of between about 0.01% to about 3.0%.

10 75. The method of claim 72, wherein the composite is administered in a dosage of between about 0.01 mg/kg to about 1.0 mg/kg by body weight.

76. The method of claim 72, wherein the composite is administered in a dosage of between about 1 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> by body surface.

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77. A method of enhancing and prolonging the ability of an oxidized glutathione-based compound to stimulate endogenous production of cytokine and hemopoietic factors, said method comprising interacting the oxidized glutathione-based compound with a metal material in a molar equivalent ratio of between about 3000:1 to about 1:1 wherein the metal material comprises a metal selected from the group consisting of platinum and palladium.

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78. The method of claim 68, wherein said cells are in a mammalian body and said composite is introduced into said body at a rate of from about 0.01 mg/kg to about 1.0 mg/kg of body weight at least one time a day for at least one day.

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79. The method of claim 68, wherein said cells are in a mammalian body and said composite is introduced topically to a topical area at a dose of from about 1.0 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> of topical area.

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80. A method for treating a subject having a disease, comprising:  
administering to the subject in need of such treatment a composite comprising an oxidized glutathione-based compound and a metal material in a molar equivalent ratio of between about 3000:1 to about 1:1 in an amount effective to stimulate endogenous

production of cytokines and or hemopoietic factors or both, to obtain a therapeutic effect, wherein the metal material comprises a metal selected from the group consisting of platinum and palladium.

5 81. The method of claim 80, wherein the molar equivalent ratio is between about 1000:1 to about 1:1.

82. The method of claim 80, wherein the molar equivalent ratio is between about 1000:1 to about 10:1.

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83. The method of claim 80, wherein the molar equivalent ratio is between about 1000:1 to about 100:1.

84. The method of claim 80, wherein the disease is lung cancer and the composite is  
15 GSSG•Pt.

85. The method of claim 80, wherein the disease is melanoma and the composite is bis-(-iodine-tyrosyl)-GSSG•Pt.

20 86. The method of claim 80, wherein the disease is a cerebral tumor and the composite is bis-(dopamine)-GSSG•Pt.

87. The method of claim 80, wherein the disease is a colorectal cancer and the composite is bis-(cysteamine)-GSSG•Pt.

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88. The method of claim 80, wherein the disease is breast cancer and the composite is cysteamine-GSSG•Pt.

89. The method of claim 80, wherein the disease is prostate cancer and the composite is  
30 dizinc salts of GSSG•Pt.

90. The method of claim 80, wherein the disease is ovarian cancer and the composite is theophylline-GSSG•Pt.

91. The method of claim 80, wherein the disease is acute lymphoblastic leukosis and the composite is a lithium salt of GSSG•Pt.
- 5 92. The method of claim 80, wherein the disease is acute myeloblastic leukosis and the composite is selected from the group consisting of dilithium salt of GSSG•Pt and cysteamine-GSSG•Pt and combinations thereof.
93. The method of claim 80, wherein the disease is tuberculosis and the composite is bis-  
10 (histidyl)-GSSG•Pt.
94. The method of claim 80, wherein the disease is selected from the group consisting of viral hepatitis B, viral hepatitis C, and mixed-infections thereof and the composite is selected from the group consisting of GSSG•Pt and inosine-5-monophosphatyl-GSSG•Pt.  
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95. The method of claim 80, wherein the disease is herpes and the composite is selected from the group consisting of GSSG•Pt and inosine-5-monophosphatyl-GSSG•Pt.
96. The method of claim 80, wherein the disease is meningitis, sepsis and the composite  
20 is tetra-dopamine-GSSG•Pt.
97. The method of claim 80, wherein the disease is peritonitis and the composite is selected from the group consisting of GSSG•Pt and tetra-dopamine-GSSG•Pt and combinations thereof.  
25
98. The method of claim 80, wherein the disease is acute pancreatitis and the composite is selected from the group consisting of GSSG•Pt and inosine-5-monophosphatyl-GSSG•Pt and combinations thereof.
- 30 99. The method of claim 80, wherein the disease is suppurative post-surgery sequelae and the composite is selected from the group consisting of GSSG•Pt and inosine-5-monophosphatyl-GSSG•Pt and combinations thereof.

100. The method of claim 80, wherein the disease is AIDS and the composite is selected from the group consisting of GSSG•Pt and uridine-(5-monophosphatyl)-GSSG•Pt and combinations thereof.
- 5 101. The method of claim 80, wherein the disease is immunosuppressions of infectious origin and the composite is selected from the group consisting of GSSG•Pt and uridine-(5-monophosphatyl)-GSSG•Pt and combinations thereof.
- 10 102. The method of claim 80, wherein the disease is glomerulonephritis and the composite is selected from the group consisting of GSSG•Pt and a lithium salt of GSSG•Pt and combinations thereof.
- 15 103. The method of claim 80, wherein the disease is selected from the group consisting of rheumatoid arthritis and the composite is selected from the group consisting of GSSG•Pt and a lithium salt of GSSG•Pt and combinations thereof.
- 20 104. The method of claim 80, wherein the disease is collagenosis and the composite is selected from the group consisting of GSSG•Pt and a lithium salt of GSSG•Pt and combinations thereof.
- 25 105. The method of claim 80, wherein the disease is systemic lupus erythematosus and the composite is selected from the group consisting of GSSG•Pt and a lithium salt of GSSG•Pt and combinations thereof.
- 30 106. The method of claim 80, wherein the disease is an atopic form of an allergic condition and the composite is selected from the group consisting of GSSG•Pt and dihydrofluoride-GSSG•Pt and combinations thereof.
107. The method of claim 80, wherein the disease is diabetes-type I and the composite is a vanadium salt of GSSG•Pt.
108. The method of claim 80, wherein the disease is diabetes-type II and the composite is bis-(lipoyl)-GSSG•Pt.

109. The method of claim 80, wherein the disease is an ischemic cerebral condition and the composite is bis-(phenylalanyl)-GSSG•Pt.

5 110. The method of claim 80, wherein the disease is an ischemic heart disease and the composite is bis-(carnosyl)-GSSG•Pt.

111. The method of claim 80, wherein the disease is an ischemic heart disease manifested mainly as a syndrome of functional myocardial failure and the composite is glycerol-(1,3-  
10 diphosphatyl)-GSSG•Pt.

112. The method of claim 80, wherein the disease is neurodegenerative disease and the composite is bis-(3,4-dihydroxyphenylalanyl)-GSSG•Pt.

15 113. The method of claim 80, wherein the disease is demyelinating disease and the composite is bis-(3,4-dihydroxyphenylalanyl)-GSSG•Pt.

114. The method of claim 80, wherein the disease is cerebral hypoxia and the composite is gamma-hydroxy-(butanoyl)-GSSG•Pt.  
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115. The method of claim 80, wherein the disease is manic-depressive psychosis and the composite is gamma-amino-(butanoyl)-GSSG•Pt.

116. The method of claim 80, wherein the disease is metabolic disease and the composite  
25 is bis-(nicotinoyl)-GSSG•Pt.

117. The method of claim 80, wherein the disease is an endocrinal disease and the composite is folliculyl-(succinyl)-GSSG•Pt.

30 118. The method of claim 120, wherein said normal and transformed cells are in a mammalian body and said composite is introduced into said body at a rate of from about 0.01 mg/kg to about 1.0 mg/kg of body weight at least one time a day for at least one day.

119. The method of claim 120, wherein said normal and transformed cells are in a mammalian body and said composite is introduced topically to a topical area at a dose of from about 1.0 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> of topical area.

5 120. The method of claim 77, wherein the enhancement and prolonging of the ability of the oxidized glutathione-based compound to stimulate endogenous production of cytokine and hemopoietic factors comprises a process selected from the group consisting of regulating proliferation in normal cells, regulating differentiation in normal cells and inducing apoptosis of transformed cells.

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121. The composite of claim 1, wherein the composite is present in a dosage form for therapeutic use.

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122. The composite of claim 121, wherein the dosage is between about 0.10 mg/kg to about 1.0 mg/kg by body weight.

123. The composite of claim 121, wherein the dosage is between about 1 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> by body surface.

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124. The composite of claim 121, wherein the composite is capable of being introduced topically and the dosage is between about 1 mg/m<sup>2</sup> to about 100 mg/m<sup>2</sup> of topical area.

125. The composite of claim 122, wherein the composite is capable of being introduced in injectable form in a concentration between about 1% to about 10% by weight/volume.

25

126. The composite of claim 122, wherein the composite is capable of being introduced in injectable form in a concentration between about 0.01% to about 3.0% by weight/volume.

127. The composite of claim 1, wherein the composite is GSSG•Pt.

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128. The composite of claim 1, wherein the composite is a salt of GSSG•Pt.

129. The method of claim 52, wherein the composite is GSSG•Pt.

130. The method of claim 52, wherein the composite is a salt of GSSG•Pt.
131. The method of claim 77, wherein the composite is GSSG•Pt.
- 5 132. The method of claim 77, wherein the composite is a salt of GSSG•Pt.
133. The method of claim 80, wherein the composite is GSSG•Pt.
- 10 134. The method of claim 80, wherein the composite is a salt of GSSG•Pt.
135. The composite of claim 123, wherein the composite is capable of being introduced in injectable form in a concentration between about 1% to about 10% by weight/volume.
- 15 136. The composite of claim 123, wherein the composite is capable of being introduced in injectable form in a concentration between about 0.01% to about 3.0% by weight/volume.
- 20 137. A composite comprising an oxidized glutathione-based compound comprising a carbon/nitrogen backbone of each of a dimer of a glutamic acid bonded to a cysteine bonded to a glycine, the dimer being linked through a disulfide unit, said composite further comprising a metal material in a molar equivalent ratio of between about 3000:1 to about 1:1, wherein the metal material comprises a metal selected from the group consisting of platinum and palladium.